

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/CA2005/000124

| <b>A. CLASSIFICATION OF SUBJECT MATTER</b><br>IPC(7): B01D 57/02, G01N 1/28, G01N 1/40, G01N 37/00, G01N 27/447<br>According to International Patent Classification (IPC) or to both national classification and IPC   |   |  |
|--|---|--|
| <b>B. FIELDS SEARCHED</b><br>Minimum documentation searched (classification system followed by classification symbols)<br>IPC(7): B01D 57/02, G01N 1/28, G01N 1/40, G01N 37/00, G01N 27/447<br>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched   |   |  |
| Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)<br>CPD (Canadian Patent Database), Delphion, Esp@cenet  |   |  |
| <b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>  |   |  |
| Category*  | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No.  |
| A  | Asbury et al., "Trapping of DNA in Nonuniform Oscillating Electric Fields", Biophysical Journal, Volume 74, February 1998, 1024-1030. (02-1998)   | 1-112, 141-167 and 182   |
| A  | Chacron et al., "Particle Trapping and Self-Focusing in Temporally Asymmetric Ratchets with Strong Field Gradients", Physical Review E, Volume 56, Number 3, September 1997, 3446-3450. (09-1997) | 1-112, 141-167 and 182   |
| A  | Asbury et al., "Trapping of DNA by Dielectrophoresis", Electrophoresis 2002, 23, 2658-2666. (2002)  | 1-112, 141-167 and 182   |
| <input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.  |   |  |
| * Special categories of cited documents:<br>"A" document defining the general state of the art which is not considered to be of particular relevance<br>"B" earlier application or patent but published on or after the international filing date<br>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)<br>"O" document referring to an oral disclosure, use, exhibition or other means<br>"P" document published prior to the international filing date but later than the priority date claimed |   | "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention<br>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone<br>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art<br>"&" document member of the same patent family |
| Date of the actual completion of the international search<br>24 May 2005 (24-05-2005)  |   | Date of mailing of the international search report<br>02 June 2005 (02-06-2005)  |
| Name and mailing address of the ISA/CA<br>Canadian Intellectual Property Office<br>Place du Portage I, C114 - 1st Floor, Box PCT<br>50 Victoria Street<br>Gatineau, Quebec K1A 0C9<br>Facsimile No.: 001(819)953-2476  |   | Authorized officer<br>James McCarthy (819) 994-0411  |

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/CA2005/000124

## Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of the first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons :

1. ☐ Claim Nos. :  
because they relate to subject matter not required to be searched by this Authority, namely :
  
2. ☒ Claim Nos. : **183 and 184**  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically :  
  
Omnibus claims, such as Claims 183 and 184, are of indefinite scope thus prohibiting the examiner from performing a meaningful search.
  
3. ☐ Claim Nos. :  
because they are dependant claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows :

\*\*\*See Extra Sheet - Page 4\*\*\*

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claim Nos. :
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim Nos. : **1-112, 141-167 and 182**

Remark on Protest ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.  
☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.  
☐ No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/CA2005/000124

\*\*\*Box No. III Continued...\*\*\*

**Group A:** Claims 1-112, 141-167 and 182 are directed to a method and apparatus for causing motion (or concentration) of particles in a medium comprising a time-varying driving field and a mobility-varying field (being different in type from the former and/or non-aligned with the former) wherein said fields are applied simultaneously to the medium.

**Group B:** Claims 113-140 are directed to methods for extracting particles from a first medium comprising the steps of providing a second medium adjoining the first medium at an interface and applying an asymmetric driving field across the interface which causes the particles to drift across the interface into the second medium.

**Group C:** Claims 168-181 are directed to an apparatus for concentrating particles from a medium comprising three or more non-collinear electrodes in electrical contact with the medium and a control system connected to vary voltages applied to said electrodes over time to apply to the medium a first electric field having an alternating component directed in a first direction and a second electric field having an alternating component transverse to the first direction.